CLAIMS

1. A device for monitoring the fuel pressure in the fuel feed circuit (7) of a fuel injection internal combustion engine (2), which comprises at least one cylinder (2) and one exhaust line (6) for the combustion gases, characterized in that said device comprises

- means (8) for generating a value for measuring the fuel/air ratio of the exhaust gases in said exhaust line (6),
- means (9) for generating a value for measuring the fresh air flow rate into said cylinder (2),
- means (10, 12) determining the mechanical opening time of the injector (4) of said cylinder (2), and
- computation means (12) for determining a reconstituted fuel pressure value from said value for measuring the fuel/air ratio of the exhaust gases, from said value for measuring the fresh air flow rate and from said mechanical opening time of the injector (4).

2. The device as claimed in claim 1, characterized in that it comprises,

- means (12) for determining the value of the mass of fuel injected from said value for measuring the fuel/air ratio of the exhaust gases and from said value for measuring the fresh air flow rate,
- means (12) for determining the value of the static flow rate of the injector as a function of said value of the mass of fuel injected and of said mechanical opening time of the injector,
- means (12) for determining said reconstituted pressure value from said static flow rate of the injector and from the value of the pressure near the injector nozzle.

3. The device as claimed in either of claims 1 and 2, characterized in that it comprises means (12) for determining said mechanical opening time of the injector from the electrical control time d1 of the injector, from the time interval d2 necessary for the mechanical opening of the injector, and from the time interval d3 necessary for the mechanical closing of the injector, according to the equation d = d1 - d2 + d3.

4. The device as claimed in one of claims 1 to 3, characterized in that it comprises

- a sensor (11) for measuring the fuel pressure in said fuel feed circuit (7),
- means (12) for making a comparison between the value for measuring the fuel pressure taken by said sensor (11) and said reconstituted fuel pressure value and
- means (3) for making a diagnosis of the operating status of said pressure sensor (11) from the result of said comparison.

5. The device as claimed in one of claims 1 to 4, characterized in that it comprises means (13) for initiating a fallback operating mode, when said reconstituted fuel pressure value is higher, respectively lower, than a predefined maximum, respectively minimum, threshold value.

6. The device as claimed in one of claims 1 to 5, characterized in that it comprises means (14) for adjusting the pressure from said reconstituted pressure value.

7. The device as claimed in one of claims 1 to 6, characterized in that it comprises

- means (12) for detecting drifts of the reconstituted fuel pressure value and/or of the value for measuring the fuel pressure and

- means (15) for making a diagnosis of the status of said fuel feed circuit (7) from said drifts.

8. A method for monitoring the fuel pressure in the fuel feed circuit (7) of a fuel injection internal combustion engine (2), which comprises at least one cylinder (2) and one exhaust line (6) for the combustion gases, characterized in that it comprises the following steps:

- generation of a value for measuring the fuel/air ratio of the exhaust gases in said exhaust line (6),

- generation of a value for measuring the fresh air flow rate into said cylinder (2),

- determination of the mechanical opening time of the injector, and

- determination of a reconstituted fuel pressure value from said value for measuring the fuel/air ratio of the exhaust gases, from said value for measuring the fresh air flow rate and from said mechanical opening time of the injector.

9. The method as claimed in claim 8, characterized in that said method further comprises the following steps:

- determination of the value of the mass of fuel injected from said value for measuring the fuel/air ratio of the exhaust gases and from said value for measuring the fresh air flow rate,

- determination of the value of the static flow rate of the injector as a function of said value of the mass of fuel injected and of said mechanical opening time of the injector,

- determination of said reconstituted pressure value from said static flow rate of the injector and from the value of the pressure near the injector nozzle.

10. The method as claimed in either of claims 8 and 9, in that it further comprises the step for determining said mechanical opening time of the injector from the electrical control time d1 of the injector, from the time interval d2 necessary for the mechanical opening of the injector, and from the time interval d3 necessary for the mechanical closing of the injector, according to the equation $d = d1 - d2 + d3$.

11. The method as claimed in one of claims 8 to 10, characterized in that it further comprises the following steps:

- generation of a value for measuring the fuel pressure in said fuel feed circuit (7),

- making of a diagnosis of the operating status of said pressure sensor (11) from the result of the comparison between said value for measuring the fuel pressure taken by said sensor (11) and said reconstituted fuel pressure value.

12. The method as claimed in one of claims 8 to 10, in that it further comprises the following steps:

- detection of drifts of the reconstituted fuel pressure value and/or of the value for measuring the fuel pressure

- making of a diagnosis of the status of said fuel feed circuit from said drifts.